इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 13531 (2005): Automotive tyres - Tyre- Retreading materials for mould cure process [TED 7: Automotive Tyres, Tubes and Rims]

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

Made Available By
Public.Resource.Org

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

IS 13531 : 2005
**(Superseding IS 13530 : 1992
and IS 13532 : 1992)**

भारतीय मानक

स्वचल टायर — मोल्ड क्योर प्रक्रिया के लिए टायर-रिट्रीडिंग सामग्रियाँ

(पहला पुनरीक्षण)

Indian Standard

AUTOMOTIVE TYRES — TYRE-RETREADING MATERIALS FOR MOULD CURE PROCESS

(First Revision)

ICS 83.160.10

© BIS 2005

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

February 2005 **Price Group 3**

Automotive Tyres, Tubes and Rims Sectional Committee, TED 7

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Automotive Tyres, Tubes and Rims Sectional Committee had been approved by the Transport Engineering Division Council.

This standard was first published in 1992. This standard supersedes IS 13530 : 1992 'Automotive tyres — Retreading materials — Mould cure — General requirements' and IS 13532 : 1992 'Automotive tyres — Cushion compound for retreading — Mould cure — Specification'.

In this standard SI units have been used, the unit of force in Newton (N), of tyre load in kilogram (kg) and of pressure in pascal (Pa). Their relationships are given below for information:

1 kgf = 9.806 65 N (exactly)
1 kPa = 0.01 kgf/cm^2 (within 2% error)
1 kgf/cm^2 = 98.066 kPa

NOTE — Values of kPa rounded to the nearest practical unit.

The composition of the Committee responsible for formulation of this standard is given in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

AUTOMOTIVE TYRES — TYRE-RETREADING MATERIALS FOR MOULD CURE PROCESS

(First Revision)

1 SCOPE

This standard prescribes the requirements, methods of sampling and test for tread rubber intended for retreading pneumatic tyres.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
3400	Methods of test for vulcanized rubbers:
(Part 1) : 1987	Tensile stress-strain properties (*second revision*)
(Part 2) : 1995	Hardness (*second revision*)
(Part 3) : 1987	Abrasion resistance using a rotating cylindrical drum device (*first revision*)
(Part 8) : 1983	Resistance to crack growth (*first revision*)
(Part 9) : 1978	Density (*first revision*)
(Part 17) : 1974	Tear strength — Angular test piece
(Part 22) : 1984	Chemical analysis
4518 (Part 1) : 1967	Methods of test for styrene-butadiene rubbers (SBR): Part 1 Determination of volatile matter, total ash, organic acid, soap, antioxidants, bound styrene and Mooney viscosity
5599 : 1999	Rubber — Raw Natural and synthetic — Methods for sampling and sample preparation (*first revision*)

3 TERMINOLOGY

3.1 Tread Rubber — Tread rubber is an extruded rubber compound of specific profile and dimensions to suit the retreading of tyre casings on which the tread portion is worn out. This is generally made in long length and can be compounded from natural rubber or a blend of natural rubber, SBR or BR reinforced with suitable fillers to give the specified properties. The curative system shall consist of sulphur and accelerators capable of giving the specified storage life without any kind of bloom or partial vulcanization. The undersurface of the tread rubber is usually backed by a thin layer of tacky cushion gum of 0.8 mm. Tread rubber, however, can be produced without cushion but backed with polythene film and is referred to as tread rubber without cushion. The formation or wrinkles on the under surface of the tread rubber shall not be observed.

3.2 Cushion Backing Compounds — The cushion backing compound is usually made from Natural Rubber and containing reinforcing fillers, tackifiers required for optimum tack level and tack retention. It shall give satisfactory adhesion between the buffed carcass and tread rubber. The cushion gum surface can be backed with embossed or unembossed polyethylene/PVC or a similar material of suitable strength which is removed just prior to application of tread on the buffed casing.

3.3 Base Width — The width of the portion of the tread rubber coming in contact with cushion backing compound/buffed casing.

3.4 Crown Width — The width of the portion of the tread rubber coming in contact with design portion of the mould.

4 TYPES

4.1 Tread Rubber — Tread Rubber shall be of three types as follows:

a) Slab type;
b) Wing type; and
c) Valley type or double hump.

5 REQUIREMENTS

5.1 General

The tread rubber shall be free from foreign matter, cured bits or lumps and excessive porosity. No portion of the tread rubber shall have distortion or kinks. There shall be no blooming on either tread rubber or cushion. The backing film shall be intimately adhered to the cushion gum without wrinkles. When the backing is removed, the cushion backing should have a tacky and glossy surface free from any discoloration and wrinkles.

5.2 Curing Schedule

Cure times recommended by the supplier shall be followed by the retreader in order to achieve optimum performance.

5.3 Sampling

Sampling procedure and method of sampling shall be as per IS 5599. This procedure will ascertain the conformity of the tread rubber and allied materials meet the specifications laid down. At least 2 kg sample may be taken for testing.

5.4 Physical Properties

The physical properties of retreading materials shall conform to the specification laid down in Table 1 and Table 2.

5.5 Shelf Life

The rubber material shall render satisfactory performance and shall meet the physical property requirements specified in Table 3 when tested within 6 months from the date of manufacture. The materials sold shall be stored as indicated below:

a) Materials shall be well protected from any physical damage during transit and storage;

b) The materials shall not be stored near boilers, heaters or any source of heat; and

c) The maximum ambient temperature permitted in the area of storage is 35°C.

6 PACKING OF TREAD RUBBER

Depending upon the size, tread rubber shall be packed in standard weight rolls as agreed to between the manufacturer and the consumer. The rolls shall be inserted in a low density polythene bags of appropriate size and then finally packed in a cardboard carton. The cardboard carton shall then be bound with two rubber bands or carry straps.

6.1 Marking

Material supplied shall have the name of the manufacturer printed on the material and this shall appear at least every meter of length of tread rubber. The carton enclosing the material shall have the following details:

a) Name of the manufacturer;

b) Size;

c) Net weight;

d) Month and year of manufacture; and

e) Any special marking-like manufacturer's logo.

The carton shall carry an inspection slip denoting the date code, batch number and inspector's certification. The inspection slip shall also contain the recommended external and internal curing media details.

7 BIS CERTIFICATION MARKING

The product may also be marked with the Standard Mark.

7.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Table 1 Physical Properties for Under Tread Strip, Tread Gum and Cushion Gum

(*Clause* 5.4)

Sl No.	Properties	Requirements	Method of Test, Ref to IS 3400
(1)	(2)	(3)	(4)
i)	Appearance	The material shall have smooth finish and free from objectionable odour, foreign materials, lumps blisters, wrinkles and kinks.	—
ii)	Specific gravity, *Max*	1.13	(Part 9)
iii)	Scorch time, t_5 at 138±1°C, *Min* (t_5 Time for 5 units rise from, *Min* viscosity)	3	—
iv)	Optimum cure time (t_{90} at 138 ± °1C), *Min*	39-47	—
v)	Hardness IRHD/Durometer, shore A	45-60	(Part 2)
vi)	Stress-strain properties:		(Part 1)
	a) 300 percent modules, in kg/cm^2, *Min*	70	—
	b) Tensile strength, in kg/cm^2, *Min*	190	
	c) Elongation at break (percent), *Min*	500	
vii)	Angle tear, in kg/mm, *Min*	5	(Part 17)

Table 2 Physical Properties for Vulcanizing Solution

(*Clause* 5.4)

Sl No.	Properties	Requirements	Method of Test, Ref to IS 3400
(1)	(2)	(3)	(4)
i)	Appearance	The cement shall have smooth flow and consistency	—
ii)	Specific gravity, *Max*	1.13	(Part 9)
iii)	Scorch time, t_5 at 138 ± 1°C, *Min* (t_5 Time for 5 units rise from *Min* viscosity)	3	—
iv)	Optimum cure time (t_{90} at 138 ± 1°C), *Min*	18-30	—
v)	Hardness IRHD/Durometre, shore A	40-50	(Part 2)
vi)	Stress-strain properties:		(Part 1)
	a) 300 percent modules, in kg/cm², *Min*	45	
	b) Tensile strength, in kg/cm², *Min*	175	
	c) Elongation at break (percent), *Min*	500	
vii)	Angle tear, in kg/mm, *Min*	4	(Part 17)
viii)	Total solid content, percent, (TSC), *Min*:		(Part 22)
	a) Spray application	8 min	
	b) Brush application	10 min	
ix)	Drying: Touch dry time, at 25°C to 40°C and 70 RH, *Max*:		—
	a) Spray application	10-20 min	
	b) Brush application	30-40 min	

NOTES

1 Test at Sl No. (ii) to (vii) shall be carried out on the test specimen prepared after vulcanization of the base stock after making it free from the solvent.

2 If touch dry time achieved by application of brush is less than the specified for brush application and dries earlier within the acceptable drying time for spray application, then the same may be accepted.

Table 3 Physical Properties for Tread Rubbers

(*Clause* 5.5)

Sl No.	Nature of Test	Requirements	Method of Test, Ref to IS 3400
(1)	(2)	(3)	(4)
i)	Appearance	The material shall have smooth finish and free from objectionable odour and foreign materials	—
ii)	Specific gravity, *Max*	1.150	(Part 9)
iii)	Scorch time t_5 at 138 ± 1°C, *Min* (t_5 Time for 5 units rise from *Min* viscosity)	8 Min	—
iv)	Optimum cure time (t_{90} at 138 ± °1C), *Min*	38-46 (or as agreed to between the purchaser and the manufacturers)	—
v)	Hardness durometre shore A	55-65	(Part 2)
vi)	Stress-strain properties: Test slab to be cured at 138 ± 1°C At the recommended cure time by the manufacturer:		(Part 1)
	a) 300 percent modulus, in kg/cm², *Min*	70	
	b) Tensile strength, in kg/cm², *Min*	170	
	c) Elongation at break percent, *Min*	450	
vii)	Change in physical properties after ageing for 96 h at 70 ± 2°C:		—
	a) Hardness	+ 5	
	b) Tensile strength, *Max*	– 20 percent	
	c) Elongation at break (percent), *Max*	– 20 percent	
viii)	Angle tear, in kgf/cm, *Min*	50	(Part 17)
ix)	Abrasion resistance index, *Min*	90	(Part 3)
x)	Cut growth after 50 k cycles, *Max*	12	(Part 8)
xi)	Ash content, in percent, *Max*	4	(Part 22)

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Automotive Tyres, Tubes and Rims Sectional Committee, TED 7

Organization	*Representative(s)*
Central Institute of Road Transport, Pune	Shri A. S. Lakra (***Chairman***) Shri N. R. Kachare (***Alternate***)
All India Motor Transport Congres, New Delhi	Shri Chittaranjan Das
Apollo Tyre Ltd (Representing ATMA), New Delhi	Shri Vijay Sethi Shri Rajiv Budhiraja (***Alternate***)
Ashok Leyland Ltd, Chennai	Shri R. C. Balakrishanan Shri C. Sundarsanan (***Alternate***)
Association of State Road Transport Undertaking, New Delhi	Shri P. S. Shrimali Shri S. K. Patra (***Alternate***)
Automotive Research Association of India, Pune	Shri N. V. Karanth Shri A. R. Arankale (***Alternate***)
Bajaj Auto Ltd, Pune	Shri C. Y. Deshpande Shri T. M. Balaraman (***Alternate***)
Bajaj Tempo Ltd, Pune	Shri S. M. Paranjpe Shri A. A. Khinvsara (***Alternate***)
Controllerate of Quality Assurance (Vehicles), Ahmednagar	Shri Prakash Chitnis Maj Deepak Sharma (***Alternate***)
Department of Heavy Industry, New Delhi	Shri Sushil Kumar Shri S. Lakra (***Alternate***)
Department of Industrial Policy & Promotion, New Delhi	Shri P. K. Jain
Directorate General of Supplies & Disposals, New Delhi	Shri A. K. Varma Shri R. P. Singh (***Alternate***)
Escorts Tractors Ltd (Research & Development Centre), Faridabad	Shri S. K. Garg Shri M. Ravi (***Alternate***)
Fiat India Pvt Ltd, Mumbai	Shri V. Murugan
HMT Ltd, Pinjore	Shri Alok Nigam Shri P. K. Aggarwal (***Alternate***)
Hyundai Motor India Ltd, Chennai	Shri A. P. Gandhi
Indian Tyre Technical Advisory Committee, New Delhi	Shri Tom K. Thomas Shri T. Falcao (***Alternate***)
Mahindra & Mahindra Ltd, Nasik	Shri Kailash Jat
Maruti Udyog Ltd, Gurgaon	Shri Sangeet Oswal Shri Rajnish Kumar (***Alternate***)
Ministry of Road Transport & Highways, New Delhi	Director (Technical)
Ordnance Factory Board, Kolkata	Shri K. N. Arya Shri D. K. Bangotra (***Alternate***)
Schrader Duncon Limited, Mumbai	Shri P. P. Prabhu Shri P. J. Shetty (***Alternate***)
Society of Indian Automobile Manufactures, New Delhi	Shri Rajat Nandi
Tata Motors Limited, Pune	Shri S. P. Mookherjee Shri P. K. Banerjee (***Alternate***)
Toyata Kirloskar Motor India Ltd, Bangalore	Shri Sachio Yanazabi
Tractor Manufacturer's Association, New Delhi	Shri T. C. Gopalan Shri N. L. K. Malhotra (***Alternate***)
Triton Valves Ltd, Mysore	Shri S. Mallikarjunaiah Shri S. Ramesh (***Alternate***)

Organization	*Representative(s)*
Vehicles Research & Development Establishment, Ahmednagar	Shri S. Pal Shri D. Radhakrishna (*Alternate*)
Wheels India Ltd, Chennai	Shri V. Chakrarajan Shri S. Muthukrishnan (*Alternate*)
Yamaha Motor India Pvt Ltd, Faridabad	Shri B. Sarkar Shri Parveen Sharma (*Alternate*)
BIS Directorate General	Shri K. K. Vashistha, Director and Head (TED) [Represening Director General (*Ex-officio*)]

Member Secretary
Shri V. Arumugam
Joint Director (TED), BIS

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act,* 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

This Indian Standard has been developed from Doc : No. TED 7 (449).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110 002
Telephones : 2323 01 31, 2323 33 75, 2323 94 02

Telegrams : Manaksanstha
(Common to all offices)

Regional Offices :		Telephone
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110 002	2323 76 17 2323 38 41
Eastern	: 1/14 C.I.T. Scheme VII M, V. I. P. Road, Kankurgachi KOLKATA 700 054	2337 84 99, 2337 85 61 2337 86 26, 2337 91 20
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160 022	260 38 43 260 92 85
Southern	: C.I.T. Campus, IV Cross Road, CHENNAI 600 113	2254 12 16, 2254 14 42 2254 25 19, 2254 23 15
Western	: Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400 093	2832 92 95, 2832 78 58 2832 78 91, 2832 78 92

Branches : AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. NALAGARH. PATNA. PUNE. RAJKOT. THIRUVANANTHAPURAM. VISAKHAPATNAM.

Printed at Prabhat Offset Press, New Delhi-2